



# CIRM Shared Research Laboratory Information Form – Part Two

## Section A. Project Information

Project Title USC Center for Stem Cell and Regenerative Medicine: Shared Research Laboratory and Course in Current Protocols in Human Embryonic Stem Cell Research

Limited to 300 Characters

Project Start Date Aug 1, 2007

Construction Start Date Aug 15, 2007

Occupancy Date Feb 11, 2008

Total Part Two Funds Requested for Shared Laboratory Space \$1,847,800

Total Part Two Funds Requested for Stem Cell Techniques Course \$ 498,300

Total Capital Funds Requested \$ 523,300

Note: All green fields are calculated values. Do not enter a value in the field.

Please indicate whether you propose to apply for funding of a Stem Cell Techniques Course along with the Shared Laboratory Space, or just the Shared Laboratory Space.

☐ Shared Research Laboratory only

☒ Shared Research Laboratory and Stem Cell Techniques Course

**NOTE: Please be aware that any information you provide in this form will be made publically available.**

## Section A. 1. Program Director

Name	Professor	Martin	F.	Pera	
	Prefix	First	Middle	Last	Suffix
Email (office)	pera@usc.edu			This email address identifies you to CIRM. Please use this email address for all correspondence with CIRM.	
Application Number	CL1-00524-1			This field should fill automatically, based on the email address. If not, enter the number you received via email from CIRM, in the form "XX9-99999-9", where "X" is a letter, and "9" is a digit.	

## Section A. 2. Facilities Contact

Name	Mr.	Mark		May	
	Prefix	First	Middle	Last	Suffix
Institution	University of Southern California				
Other Institution	If your institution is not listed, please identify the name of the institution here.				
Position Title	Interim Director, Health Sciences Campus				
Department	Facilities Management Services				
Address	4351 Valley Boulevard				
City	Los Angeles			CA	Zip Code 90032-3632
Phone Number	(323) 224-7025		Ext	Fax Number (323) 224-7008	
Email (office)	mmay@fms.usc.edu			This email address identifies you to CIRM. Please use this email address for all correspondence with CIRM.	



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## Section A. 3. Public Abstract

See Appendix A.

## Section A. 4. Statement of Benefit to California

See Appendix A.



# CIRM Shared Research Laboratory Information Form – Part Two

## Section B. Laboratory Renovation Plan

Project Manager	Maria Morgan	Construction Supervisor	Van Duong
Title	Project Manager	Title	Project Manager
Company/Institution	University of Southern California	Company/Institution	Rudolph and Sletten, Inc.

Describe plans for development/renovation of the shared laboratory space including fixed equipment costs. Include a description of the current space and how it will be renovated and reconfigured to form the laboratory. Include as attachments one 11x17 page of the current floor plan space and one 11x17 page of proposed floor plan of the renovated space. Describe all renovations that will be done. Describe how the project will be managed and tracked, as well as how change orders will be handled. For laboratories that are proposed to be located in leased space, provide information regarding the institution's long-term access to the leased space. Describe plans and schedule for all phases of development including design, construction, and installation of equipment leading to a functional laboratory. Give a proposed contingency plan in case of cost overruns. Any additional costs due to budget overruns will be the responsibility of the grant recipient. (narrative limited to 3 pages)

### BACKGROUND

The Shared Research Laboratory (SRL) of the Center for Stem Cell and Regenerative Medicine (CSCRM) at the University of Southern California will provide a comprehensive support service for human embryonic stem cell (hESC) researchers at our University and at neighboring institutions without regard to federal limits on their use, thereby increasing the number of scientists working with human embryonic stem cells and the range of studies being conducted.

The mission of the SRL will be fourfold: 1) maintenance and supply of stocks of quality-controlled hESC lines, including many not on the NIH registry; 2) provision of space, equipment, and expertise to enable investigators new to hESC research to undertake pilot projects and generate preliminary data, including projects not utilizing NIH-approved cell lines; 3) development and evaluation of new methodology for hESC propagation by SRL staff; and 4) provision of formal training in practical aspects of hESC experimentation. The new 1,506 sq ft SRL will have seven tissue culture workstations that include biosafety cabinets, incubators, microscopes and ancillary equipment. Major moveable equipment requested to significantly extend existing analytical capabilities of CSCRM core facilities include 1) analytical flow cytometer, 2) spectral karyotyping workstation, 3) Cellomics high content cell imaging system, and 4) fluorescence and confocal microscopy.

### PROJECT SUMMARY

#### \*Description of Current Space

The SRL will be located at the southwest corner of the 5th floor laboratory in the new 10-story 172,440 sq ft Harlyne J. Norris Research Tower (HNRT) on the USC Health Sciences Campus. The HNRT research floors are organized along a central double-loaded corridor with open wet labs and lab support modules to the north and south of the corridor. The corridor terminates in an interaction space at the west and private investigator offices and a conference room at the east. A cylindrical tower located at the south-east corner of the HNRT contains the vertical circulation elements for the research tower. The HNRT design combines office space, basic wet laboratory space, dry laboratory space, conference rooms and core facilities such as a glass washer and a freezer room. The HNRT is ideally suited to modifications that will accommodate the specialized needs of the hESC Shared Research Laboratory and Current Protocols Course in hESCs. \*No federal funds were used in the construction of the HNRT.

The layout of the HNRT laboratories is based upon a modular planning grid that is 21'-0" by 30'-0". The planning module includes the organized and systematic delivery of piped laboratory services, HVAC, fume hood exhaust ducts, power and signal cables. These services are delivered to each laboratory in a methodical manner, thus changes in laboratory use requiring addition or deletion of services is easy to accomplish because of the regular nature of the infrastructure. The modular design establishes a grid by which walls and partitions are located. Finally, each of the HNRT laboratories is provided with support rooms – fume hood alcoves, equipment rooms, tissue culture rooms – that are units of the standard planning grid and will be incorporated into the design of the SRL.

#### \*Description of Renovation Plans

We intend to take advantage of the modular design of the HNRT by subdividing the laboratory along a grid-line. The SRL will be situated within roughly one half of a module. Working within the modular design, we intend to remove two-20' benches. One of these is located along the southwest corner along an outside wall of the laboratory; the other is located along one of the grid-lines in the laboratory. The benches along the wall and grid-line will be replaced with tissue culture work stations, hoods, incubators, and ancillary support equipment. The tissue culture work stations on the grid-line in the laboratory will be separated from the rest of the south 5th floor laboratory by a 7ft tall partition that will serve 2 purposes 1) provide a physical barrier to help define the SRL and 2) provide a pleasing view of the SRL whether inside or outside the SRL. In keeping with the open design of the HNRT and provide a welcoming and collaborative working environment, we intend to situate the tissue culture work stations along the perimeter of the SRL, and smaller analytical equipment in the center of the SRL. In addition to the 5 tissue culture work stations located in the open laboratory, where training, pilot studies, and collaborative studies will take place, there is a pre-



## CIRM Shared Research Laboratory Information Form – Part Two

### Section B -- 1. Laboratory Renovation Plan (continued)

existing tissue culture room that will be outfitted to support the preparation of stock cultures with 1 new station and 1 existing tissue culture hood and 2 incubators, microscope and other equipment required. The SRL has 2 dry labs for outfitted for 6 microscopy stations. Adjacent to the wet laboratory, on the other side of the partition, 5 computer workstations will be installed for staff and scientists working in the shared laboratory.

note for clarification: In the part 1 application, we sited the SRL on the 4th floor of HNRT not the 5th floor.

It will be located on the 5th floor. The floors are nearly identical.

**SITE:** The SRL will be located within the newly constructed HNRT on the USC Health Sciences Campus at the corner of Biggy Street and Eastlake Avenue near downtown Los Angeles. A bus stop across the street from the HNRT provides access to USC run shuttles to and from Union Station, Los Angeles Children's Hospital and other USC facilities. The USC Health Sciences campus is envisioned to be an integral part of a greater master plan to develop a new high-tech, biomedical research campus.

**SECURITY AND ACCESS:** Access into the building is controlled by proximity card readers on perimeter doors. Another layer of security is provided by a card reader door on every floor of the building that limits access into the various labs and offices. The SRL will be staffed 8am through 6pm weekdays and 9am-1pm on Saturday and Sunday to assist investigators and monitor equipment and operations.

#### PLANS AND SCHEDULE FOR ALL PHASES:

Planning will begin with a review of the Schematic Design that has been submitted as part of this grant application. The design team will interview the CSCRM researchers to determine all the activities that will take place within the lab, the workflow of the lab staff, the equipment that will be housed in the space, and the utility requirements for these pieces of equipment. The Preliminary Plans that are developed will be validated by site visits with the researchers, and a constructability review with the contractor, furniture vendor, and equipment vendors. Two weeks have been allocated for the preparation of the Preliminary Plans, followed by one week of approval by CSCRM. After approval, the design team will develop Working Documents over a four week period, followed by another week of review and approval. After approval, the Working Documents will be used for plan check submission to the City of Los Angeles and for requests for bids from the various subcontractor trades that will be involved in the renovation. It is expected that the plan check/permit and bidding/award processes will occur concurrently for an eight week period, after which construction can begin. Ordering laboratory equipment, furniture, benches and cabinets will follow approval of Preliminary Plans so as to allow sufficient time for fabrication of these items. The current lead times for equipment and casework range from 8 to 12 weeks. Deliveries will be coordinated so that they are made during the appropriate stages of construction and so that there is sufficient time for start-up and testing prior to occupancy of the space.

#### MANAGEMENT AND TRACKING:

The renovation will be managed by Maria Morgan, a project manager with USC's Capital Construction Development Department (CCD). \*Maria has been managing the construction of the HNRT since its inception in May 2000 and is therefore familiar with the space that will be renovated into the Shared Research Laboratory. CCD will issue and manage the contracts with the architect, general contractor and the furniture vendors on the project. Equipment purchases will be managed by CSCRM SRL Laboratory Manager. It is our intent to contract the design and construction services to the companies that have already been working on the HNRT project in order to take advantage of the experience and lessons learned from the construction of the building.

\* Lee, Burkhardt, Liu, Inc. (LBL), located in Marina Del Rey, California, is one of the country's largest architectural design firms specializing in academic, research and healthcare facilities. LBL has a staff of professional architects, designers, and planners who provide a full range of architectural, planning, and interior design services. They have received two awards from the American Institute of Architects for the design of the Harlyne Norris Research Tower.

\* Rudolph and Sletten, Inc. (R&S) is a leader in California construction, building everything from biotech laboratories and medical facilities to corporate campuses and educational institutions. With offices in Redwood City, Irvine, Sacramento, and San Diego, California, they provide general contracting, preconstruction, site selection, design/build, and construction management services. They were the general contractor for two other buildings on the USC Health Sciences Campus – the Zilkha Neurogenetic Institute, completed in April 2003 and the Healthcare Consultation II Building, completed in March 2004. Since USC has contracts currently open with these firms for the HNRT project, the award of the design and construction contracts for the Shared Research Laboratory will be a much simpler and faster process.

The project team consisting of CCD, the architect, the general contractor, the Program Director, and the Laboratory Manager will meet at least once a week during the course of the project. At these meetings, progress updates will be shared among the members of the team, and any design or construction issues will be resolved. Prior to the start of construction, the contractor will prepare a baseline construction schedule which will be reviewed and updated at every meeting. Meetings can be held more frequently during construction so that there is timely problem-solving and decision-making to keep the work on schedule.

**CHANGE ORDERS:** We anticipate that the careful planning during the development of the Preliminary Plans and Working Drawings will minimize the change to the scope of the project. The budget that has been submitted with this grant application will be tested after the development of Preliminary Plans and after Working Drawings, so that there is a fair level of certainty on +



## CIRM Shared Research Laboratory Information Form – Part Two

### Section B -- 1. Laboratory Renovation Plan (continued)

the budget prior to bidding for construction. In the event that there are unavoidable changes during the construction period, the project team will work to develop a scope of work that will then be priced by the contractor. Pricing and schedule revisions will be reviewed, along with any alternate methodologies that may be suggested by the contractor or subcontractors. Any change in the construction contract amount and/or schedule will be approved by the Program Director and CCD prior to directing the contractor to proceed with the change. CCD will track Change Orders to make sure that they can be accommodated within the project budget.

**CONTINGENCY PLAN FOR COST OVERRUNS:** We understand that cost overruns, beyond the contingency built into the budget, are the responsibility of USC. We have diligently planned and predicted the costs of construction, however should unexpected expenses arise, USC, being fully committed to the stem cell programs being developed by its scientists and in the overall goals set forth by the CIRM in the State, will cover expenses as necessary to reach the goal of a developing a Shared Research Laboratory dedicated to the use of hESCs. USC is fully committed to this project and will continue to support the goals of the CSCRIM through the construction of this specialized shared laboratory resource that will greatly increase our ability to contribute to the overall goals of expanding the study and use of hESCs without regard to federal limits.

\*Attached is a graphical schema of the project plan and schedule.





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## Section B. 1. Schedule/Timeline and Drawdown of Funds Table

Provide a realistic schedule and drawdown of funds for completing each activity/milestone, as indicated below.

#	Activity/Milestone	Start Date	Completion or Milestone Date	Amount of CIRM funds to be drawn
1	Grant Award (estimate)		Aug 1, 2007	
2	Request for Planning Funds (10% of Construction Costs)		Aug 15, 2007	\$ 42,960
3	Prepare Preliminary Plans	Aug 15, 2007	Aug 29, 2007	
4	Approval of PPs		Sep 6, 2007	
5	Prepare Working Drawings	Sep 7, 2007	Oct 4, 2007	
6	Approval of WDs		Oct 11, 2007	
7	Request Construction Contract funds (80% of Construction Costs)		Oct 12, 2007	\$343,680
8	Advertise for Construction Contract	Oct 12, 2007	Nov 15, 2007	
9	Award Construction Contract		Dec 10, 2007	
10	Construction Activities	Dec 11, 2007	Jan 11, 2008	
11	Completion of Equipment Purchases		Nov 8, 2007	
12	Request Equipment Purchase funds		Nov 16, 2007	1,000,000
13	Beneficial Occupancy		Feb 11, 2008	
14	Notice of Completion		Feb 19, 2008	
15	Request Construction Completion Amount (10% of Construction Funding)		Feb 27, 2008	\$ 42,960

"Preliminary Plans" (PPs) represent approximately 35 percent of the design effort, or may be considered the product of completing the "Design Development" (DDs) phase of architectural work.

"Working Drawings" (WDs) represent drawings and specifications from which a contractor may determine the full extent of work contemplated in the project for purposes of submitting a bid; may be referred to as completion of "Construction Documents" (CDs) phase of architectural work.



## CIRM Shared Research Laboratory Information Form – Part Two

### Section B. 2. Budget

Provide a complete budget for the renovation that includes construction costs, design fees, administration of the project, other costs (i.e. installation of equipment) and a construction contingency (limited to 7-10% of the construction budget). Identify the amount of CIRM funds requested and the matching funds (construction requires 20% matching funds). Provide a complete budget for movable equipment (equipment requires 20% matching funds). **(narrative limited to 3 pages)**

(Note: An Excel spreadsheet can be attached as long as the total submission for this Section is limited to 3 pages)

The USC Shared Research Laboratory (SRL) will be located on the Health Sciences Campus, on the 5th floor of the newly constructed Harlyne Norris Research Tower (HNRT), which is expected to open for occupancy in June of 2007. Since the laboratories of the HNRT were designed on a modular grid as open laboratories where the services are supplied at regular intervals on a grid of 21'-0"x 30'-0" these laboratories are ideally suited to support our modification plans. We have designed a dedicated specialized research laboratory for the culture of human embryonic stem cells (hESCs) without regard to federal limits. We view this as an important regional resource and will allow for collaborative projects, informal training, and formal hands on wet lab training at regular intervals throughout the year.

**CONSTRUCTION BUDGET:** Since, the USC SRL will be housed in a new laboratory that was designed to anticipate the inevitable changes in laboratory layout required to meet changing scientific programs and their changing equipment and space requirements, we anticipate construction to take approximately six months at a projected cost of \$523,500.

\*A detailed breakdown of the construction costs, including equipment installation, can be found in the attached table.

**FIXED EQUIPMENT:** Since we are modifying newly built laboratories, which are already outfitted with the necessary major fixed equipment, funds are requested for fixed equipment under \$5,000 only.

**MOVEABLE EQUIPMENT:** We will apply our SRL equipment funds towards sophisticated instrumentation required for state-of-the-art analysis and validation of hESC cultures and differentiated progeny. This equipment is necessary to augment the standard laboratory equipment used for basic culture and maintenance of hESCs and is a unique feature of our SRL. The equipment will be useful to many investigators at USC and neighboring institutions who have tissue culture facilities, but may not have access to this type of sophisticated analytical equipment. We believe that assembling this equipment under one roof geared towards hESC research represents a unique and important regional resource.

The four functional areas that we request equipment funds for are 1) microscopy 2) high content cell screening, 3) automated cytogenetic analysis of cultures, and 4) fluorescence activated cell sorting (FACS, or flow cytometry).

\*Specifically:

**MICROSCOPY:** Funding is requested for phase contrast microscopes to support routine cell culture and training. We also request funding for dissecting stereomicroscopes for the same purpose. We request funding for a Zeiss Axioimager to perform indirect immunofluorescence microscopy of stem cell cultures and for examination of teratoma xenografts and other histological preparations. Finally, we have requested funds for a Zeiss LSM Pascal Confocal Microscope to carry out quantitative measurements on stem cell cultures and for those working in animal models to be able to analyze the fate of stem cell grafts in tissues.

**HIGH CONTENT CELL SCREENING (HCCS):** This equipment is requested to enable medium throughput scanning of hESC grown in multiwell plates for assay of various growth and differentiation protocols. The HCCS device is a complement to flow cytometry, which can be used for some applications but does not allow assessment of spatial relationships of cells and markers. Flow cytometry also requires quantitative recovery of viable cells for analysis, something that is not always possible for hESC particularly when differentiation is extensive. Routine assessment of hESC markers will be carried out using flow cytometry, whereas screening will rely predominantly on HCCS.

**AUTOMATED CYTOGENETIC ANALYSIS (Spectral Karyotyping Workstation):** Karyotype analysis is an important aspect of hESC quality control. In the development program of the SRL, new protocols for hESC maintenance will be assessed for their ability to maintain genetic integrity of hESC. We request funding for an Applied Spectral Imaging spectral karyotyping workstation to support this important activity. Our strategy for this is to carry out routine screening using spectral karyotyping, and to consult with a cytogeneticist (Dr. Chih-Lin Hsieh) when abnormalities are observed. We will combine this analysis with SNP analysis of genomic DNA, performed by the USC genomics core laboratory, to gain a comprehensive analysis of genomic integrity of hESC lines.

**FLOW CYTOMETRY:** We request funding for an LSR II analytical flow cytometer. We anticipate very heavy usage of flow cytometry by SRL staff and by clients. Flow cytometry is the preferred technique for routine monitoring of stem cell marker expression.





## CIRM Shared Research Laboratory Information Form – Part Two

### Section B. 2. Budget (continued)

We expect that the majority of equipment listed below will have a useful life of 7-10 years. In the case of the microscopes or the high content screening system, it is likely that updates to software will be required every 2-3 years.

#### SRL Equipment List :

Equipment type	Model	Company	*Total costs
Inverted Microscope	AxioObserver	Zeiss MicroImaging	43,000
Light brightfield microscope	Axiomager/Apotome	Zeiss MicroImaging	125,000
Confocal microscope	LSM5	Zeiss MicroImaging	252,000
High Content Cell Screening	Cellomics VTI	ThermoFisher Sci.	399,000
Fluorescence Activated Cytometry	LSRII	BD Biosciences	380,500
HT Cytogenetic Analysis	SD-300-28A	Applied Spectral Imaging	125,000

Total: 1,324,500

\*costs include, shipping, taxes, calibration by vendor technicians





## CIRM Shared Research Laboratory Information Form – Part Two

### Section B. 3. Budget Summary Table

Complete the budget summary for the use of CIRM funds.

Note: All colored fields contain calculated data. Please do not enter anything in those fields.

Other Project Costs				
Budget Category		Total Budget	CIRM Grant Funds	Institutional Match
Construction Contract Costs		\$ 285,500	\$ 234,880	\$ 58,720
Other Construction Costs (institutional)		\$ 113,800	\$ 92,880	\$ 23,220
Subtotal Construction		\$ 399,300	\$ 327,760	\$ 81,940
Design Fees		\$ 41,300	\$ 27,120	\$ 6,780
Administrative Costs		\$ 35,100	\$ 35,680	\$ 8,920
Construction Contingency		\$ 47,600	\$ 39,040	\$ 9,760
Total Construction		\$ 523,300	\$ 429,600	\$ 107,400
Movable Equipment		\$1,324,500	\$1,000,000	\$ 324,500
Total Budget		\$1,847,800	\$1,429,600	\$ 431,900
Gross Square Feet	1506	\$ 347.48	\$ 285.26	Const Costs/GSF
Assignable Square Feet	1262	\$ 414.66	\$ 340.41	Const Costs/ASF



## CIRM Shared Research Laboratory Information Form – Part Two

### Section B. 4. Institutional Commitment

Provide a detailed description of the amount and source of matching funding for each request that requires matching funds. The requirement of matching funds can be satisfied if the institution can document funds, excluding other grant funds, committed to similar projects (i.e., renovation of lab space and equipment purchase) after January 1, 2005. Detail the use of the space after the three year period is completed. (narrative limited to 2 pages)

The University of Southern California is fully committed to the Center for Stem Cell and Regenerative Medicine (CSCRM) here at the Keck School of Medicine and appreciates the larger impact that our Center and its programs will have in the Los Angeles area, the State of California and internationally by providing needed shared resources and training to scientists and clinicians.

The University has demonstrated its commitment to the CSCRM by providing nearly \$10 million in start-up funds thus far: over \$2 million of which is from institutional funds; and \$7 million derived from a single source gift from the W. M. Keck Foundation re-directed for the specific use of the CSCRM to recruit new faculty and to establish necessary core resources.

USC will continue to provide the funding and resources needed to meet the required matching funds to support this endeavor and the successful implementation of the proposed Shared Research Laboratory and Course in Current Protocols in Human Embryonic Stem Cell Research as described in Part One of the Shared Research Laboratory and Techniques Course grant application.

While formal planning is underway to build a new facility which will house the CSCRM, we see the immediate need for the development of this shared laboratory dedicated to the culture and maintenance, collaborative exchange, and hands on training in the practice of human embryonic stem research without regard to federal limits as a key component of our overall efforts to develop the expertise of scientists in the Los Angeles area. Knowing that we plan to relocate at sometime in the future, we weighted our plan towards movable equipment and minimized the amount of laboratory renovation.

USC will continue to support the Shared Laboratory after the initial three year grant period. We expect the resources made available through this grant to launch important fundable research and expect the shared laboratory and wet lab training to continue to provide support those entering the human embryonic stem cell field even after the initial grant expires.

The combined SRL and Techniques Course budget request of \$2,346,100 requires a 20% institutional match of \$469,220. When we put our scientific plan together, we identified \$1,795,130 in sophisticated analytical equipment that was purchased in 2006 using private funding sources that we believe will complement the goals and extend the capabilities of the SRL. We intend to make this equipment available one day a week (20% time) to SRL investigators, giving a match of \$359,000. In addition, the equipment that intend to purchase to equip the SRL exceeds the \$1,000,000 in CIRM funding by \$324,500.

This represents matching funds of  $359,000 + 324,500 = \$683,500$  over and above the required 20% match of \$469,220 on the total combined budget of \$2,346,100.

The following is a partial list of equipment that USC has already purchased with private funds to launch the CSCRM and is representative of USC's major long term commitment to the Stem Cell program. We believe that this equipment complements the goals of proposed Shared Research Laboratory and Current Protocols Course and we plan to make this existing equipment available to those working in the SRL one day a week (20% time).



## CIRM Shared Research Laboratory Information Form – Part Two

### Section B. 4. Institutional Commitment (continued)

USC CSCRM CORE EQUIPMENT PURCHASES since July 2006

These instruments and assistance operating the equipment will be available to those working in the Shared Laboratory 20% of the time, approximately one day a week.  $(1,795,000 \times 0.2 = \$359,000 \text{ match})$

PO #	Vendor Description	Cost
H35321	Applied Biosystems 7900 HT Fast Real-Time PCR Std 96 Well	101,499.42
H34725	Molecular Devices M5 Spectramax M5 Microplate Reader	51,283.44
H35430	BD Biosciences BD LSR II Special Order System (Product 340551) and Aria Special Order System (Product 340469)	741,160.71
H35320	Carl Zeiss LSM5 Pascal Exciter and accessories	242,448.00
H35316	Carl Zeiss Confocal 2-photon scanning laser Microscope and accessories	467,982.69
H35441	Coherent, Inc. Chameleon Ultra Laser	171,373.22
H35224	Amaza Inc. AAD-1001N Nucleofector II Device	13,139.18
H35946	Bio-Rad Laboratories Gene Pulser/ Electroporator	6,243.64
	Total	1,795,130.30



## CIRM Shared Research Laboratory Information Form – Part Two

### Section C. Stem Cell Techniques Course (if applicable)

Based on the information provided in Part One of the application describing the course, include a justification of the additional space required and additional equipment requested, if any. Include additional square footage and provide as an attachment one 11x17 page of the proposed floor plan of the renovated space. (narrative limited to 1 page)

#### BACKGROUND:

The Shared Research Laboratory (SRL) of the Center for Stem Cell and Regenerative Medicine (CSCRM) at the University of Southern California will offer a course on Current Protocols in Human Embryonic Stem Cell Research. Current Protocols will provide a comprehensive practical training for investigators wishing to use human embryonic stem cells (hESCs) in their research programs. Laboratory training will take place on the 5th floor of the new Harlyne Norris Research Tower (HNRT) in the proposed SRL facility as shown in the floor plans included in this submittal. The layout of the HNRT is ideally suited to the formal course with conference rooms located on the same floor and near the laboratory for morning lectures and the 188 seat state of the art conference center on the first floor for plenary lectures by renowned stem cell scientists to be held in the evening and open to course participants, local scientists and interested lay persons.

Laboratory instruction will take place in the SRL. We see this as an efficient use of resources since it allows us to more fully utilize the course equipment and staff. While formal training will take place 3-4 times a year, we expect year round training to take place through informal training, collaboration, and SRL Oversight approved pilot studies. Training, whether during the formalized sessions or through the interaction of scientists working in the SRL, will be underway at all times.

In order to provide an appropriate environment for the specialized hands on training in hESC culture, maintenance, and differentiation, we will need to equip the laboratory with tissue culture work stations that include hoods, incubators, and microscopes for monitoring growth and assessing morphology. In addition we will need freezers, refrigerators, and other equipment in order to properly store the reagents and supplies necessary for hESC culture and maintenance.

**ADDITIONAL EQUIPMENT:** Funding is requested for laboratory equipment only (no additional funds for construction/renovation).

Funding is requested to furnish the SRL with all the equipment required to culture and maintain hESCs. This equipment will serve as the foundation for both the Current Protocols Course and the Shared Research Laboratory, both of which require tissue culture hoods, incubators, microscopes, centrifuges, freezers and refrigerators and basic laboratory equipment. We believe this is an efficient use of funds as the space, equipment, and staff will be used to capacity.

**ADDITIONAL SPACE:** No additional space requested, no additional construction/renovation funding requested

Limit narrative to visible field area.



# CIRM Shared Research Laboratory Information Form – Part Two

## Section C. 1. Schedule and Drawdown of Funds Table (if applicable)

Provide a realistic schedule and drawdown of funds for completing each activity/milestone, as indicated below.

#	Activity/Milestone	Start Date	Completion or Milestone Date	Amount of CIRM funds to be drawn
1	Grant Award (estimate)		Aug 1, 2007	
2	Request for Planning Funds (10% of Construction Costs)			\$ 000
3	Prepare Preliminary Plans			
4	Approval of PPs			
5	Prepare Working Drawings			
6	Approval of WDs			
7	Request Construction Contract funds (80% of Construction Costs)			\$ 000
8	Advertise for Construction Contract			
9	Award Construction Contract			
10	Construction Activities			
11	Completion of Additional Equipment Purchases		Nov 8, 2007	
12	Request Additional Equipment Purchase funds		Nov 16, 2007	\$498,300
13	Beneficial Occupancy		Feb 11, 2008	
14	Notice of Completion		Feb 19, 2008	
15	Request Construction Completion Amount (10% of Construction Funding)		Feb 27, 2008	\$ 000

"Preliminary Plans" (PPs) represent approximately 35 percent of the design effort, or may be considered the product of completing the "Design Development" (DDs) phase of architectural work.

"Working Drawings" (WDs) represent drawings and specifications from which a contractor may determine the full extent of work contemplated in the project for purposes of submitting a bid; may be referred to as completion of "Construction Documents" (CDs) phase of architectural work.

"Additional Equipment" represents equipment to be used for the Stem Cell Techniques Course.



# CIRM Shared Research Laboratory Information Form – Part Two

## Section C. 2. Budget (if applicable)

Provide a complete budget for the additional renovation that includes construction costs, design fees, administration of the project, other costs (i.e. installation of equipment) and a construction contingency (limited to 7-10% of the construction budget). Identify the amount of CIRM funds requested and the matching funds (construction requires 20% matching funds). Provide a complete budget for additional movable equipment (equipment requires 20% matching funds). **(narrative limited to 3 pages)**

(Note: An Excel spreadsheet can be attached as long as the total submission for this Section is limited to 3 pages)

ADDITIONAL SPACE: No additional space requested, no additional construction/renovation funding requested

ADDITIONAL EQUIPMENT: Funding is requested for laboratory equipment only (no additional funds for construction/renovation).

This equipment will serve as the foundation for both the Current Protocols Course and the Shared Research Laboratory, both of which require tissue culture hoods, incubators, microscopes, centrifuges, freezers and refrigerators and basic laboratory equipment. We believe this is an efficient use of funds as the space, equipment, and staff will be used to capacity.

Equipment type	Model number	Company	* Total costs
Ultra low freezer super insulated	SLT-25V-85SID	Pacific Science, Inc	13,600
Refrigerator, (deli case)	MPR-1013R	Sanyo E&A America	10,000
Table Top Centrifuge	Allegra X15R	Beckman Coulter Inc.	15,000
4x inverted TC Microscopes (no camera)	CKX41SF5	Olympus America	25,100
2x inverted TC Microscopes with camera	CKX41SF5	Olympus America	22,000
Fluorescent microscope with camera	SX2-ZB16;SZX16	Olympus America	41,200
2 x Stereo Microscopes	MZ6 Leica	McBain Instruments	22,400
4 x Biological Safety hoods	NU-425-400	Nuaire Inc	31,700
2 X Horizontal Clean Benches	NU-301-630	Nuaire Inc	14,100
10 x CO2 Incubators	NU-5510 DHD	Nuaire Inc	60,200
Inverted fluorescent Microscope	AxioObserver	Zeiss MicroImaging	43,000
Light brightfield microscope	Axiolmager/Apotome	Zeiss MicroImaging	125,000
Miscellaneous equipment and computers under \$5,000		various	75,000
			Total 498,300

\* cost includes, shipping, taxes, and calibration



## CIRM Shared Research Laboratory Information Form – Part Two

### Section C. 3. Budget Summary Table (if applicable)

Complete the budget summary for the use of CIRM funds.

Note: All colored fields contain calculated data. Please do not enter anything in those fields.

Other Project Costs				
Budget Category		Total Budget	CIRM Grant Funds	Institutional Match
Construction Contract Costs		\$ 000		
Other Construction Costs (institutional)		\$ 000		
Subtotal Construction		\$ 000		
Design Fees				
Administrative Costs				
Construction Contingency				
Total Construction		\$ 000		
Additional Movable Equipment		\$ 498,300	\$ 498,300	\$ 000
Total Budget		\$ 498,300	\$ 498,300	\$ 000
Gross Square Feet		\$ 0.00	\$ 0.00	Const Costs/GSF
Assignable Square Feet		\$ 0.00	\$ 0.00	Const Costs/ASF





# CIRM Shared Research Laboratory Information Form – Part Two

## Section D. Signature Page

Complete, save, and print Part Two of the Shared Research Laboratory Grant Information.

Submit electronic application as an email attachment to [laboratory@cirm.ca.gov](mailto:laboratory@cirm.ca.gov) no later than 5:00pm PST on March 16, 2007.

Mail\* the original executed Part Two application and five (5) copies to:

**Shared Research Laboratory Grant Application**

California Institute for Regenerative Medicine

210 King Street

San Francisco, CA 94107

**\*Mailing must be postmarked no later than March 16, 2007.**

**Applications will not be accepted after these deadlines.**

Project Start Date Aug 1, 2007

Construction Start Date Aug 15, 2007

Occupancy Date Feb 11, 2008

Total Part Two Funds Requested for Shared Laboratory Space \$1,847,800

Total Part Two Funds Requested for Stem Cell Techniques Course \$ 498,300

Total Capital Funds Requested \$ 523,300

### Facilities Contact

Mr. Mark May  
Interim Director, Health Sciences Campus  
Facilities Management Services  
University of Southern California  
4351 Valley Boulevard  
Los Angeles, CA 900323632  
(323) 224-7025  
[mmay@fms.usc.edu](mailto:mmay@fms.usc.edu)

\_\_\_\_\_  
Authorized Organizational Official

\_\_\_\_\_  
Date

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Program Director

\_\_\_\_\_  
Date

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title



# CIRM Shared Research Laboratory Information Form – Part Two Supplement

## Project Information

Application Number

Program Director Name:

## Historical Performance

Provide information on past performance for 3 projects.

	Project 1	Project 2	Project 3
Brief Project Title	Norris CC, Lab # 6314	ZNI Renovation # 314/315	ZNI Renovation #232 B/C/D
Original Budget (Total project cost)	\$ 186,000	\$ 73,762	\$ 149,485
Final project cost	\$ 180,000	\$ 69,700	\$ 145,888
Scheduled Completion Date	Jul 31, 2006	Jun 1, 2004	Jul 30, 2004
Actual Notice of Completion Date	Aug 22, 2006	Jun 15, 2004	Aug 15, 2004
Gross Square Feet involved	1,871	450	800
Assignable Square Feet involved	1,700	386	720
Approximate number of change orders	3	1	2
Value of all change orders & claims	\$ 18,000	\$ 7,000	\$ 22,000
Type of construction management	Design-Bid-Build	Design-Bid-Build	Design-Bid-Build

## Laboratory Alteration Projects

Please enter the number of laboratory alteration projects completed by the applicant in the past 2 years (in the range of \$1-5 million in project cost), and the approximate total dollar value that these projects represent.

Total Laboratory Alteration Projects

Approximate Total Value

Limit Budget Justification to visible field area.

# USC

## Capital Construction Development

## PROJECT BUDGET WORKSHEET

USC CSCRM Shared Research Laboratory

Date March 15, 2007

Gross Building Area: 1,506

\$347/GSF

Net Building Area: 1,262

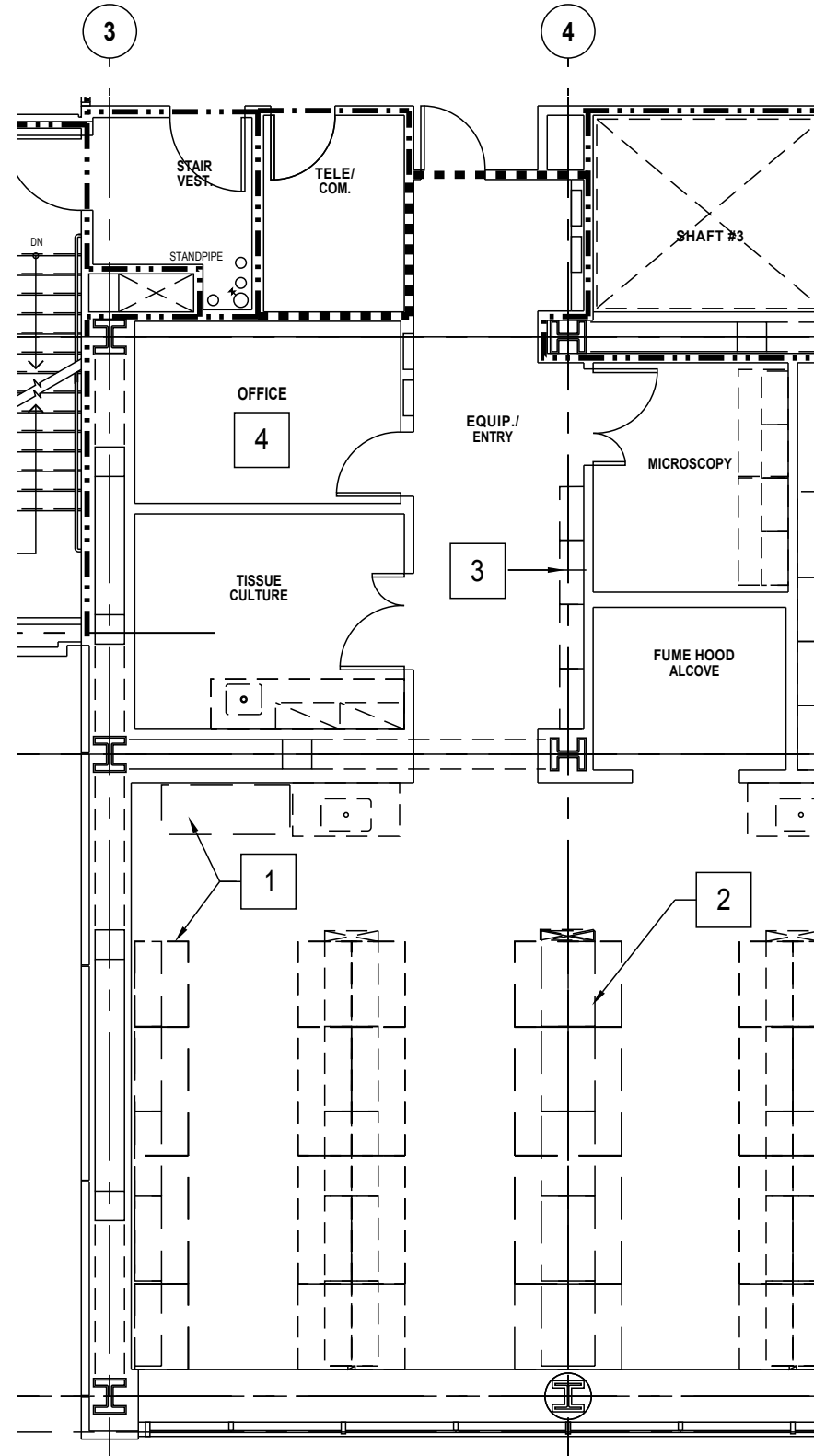
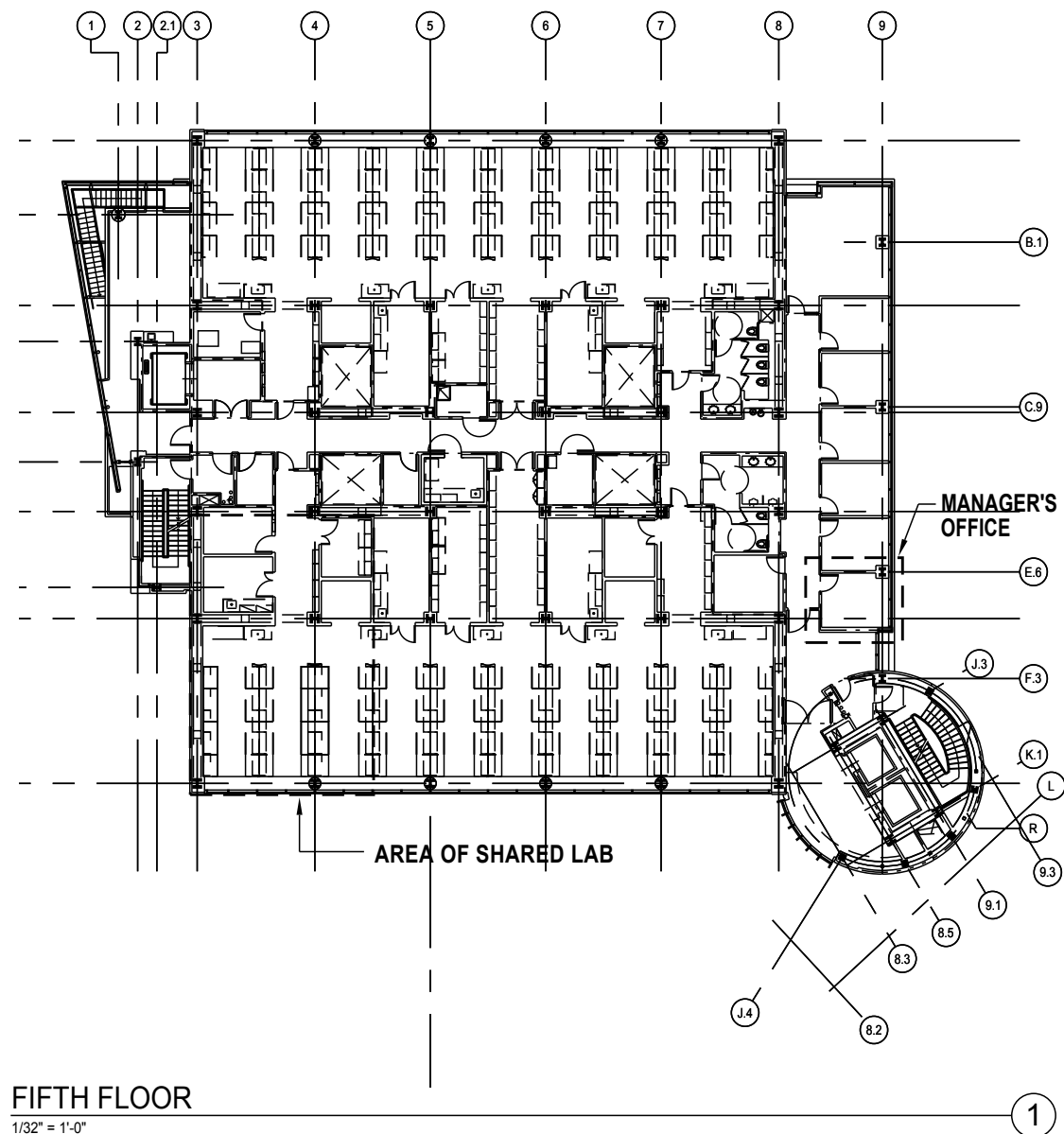
\$415/GSF

Net to Gross Ratio 83.80%

No.	Object Code	Item	Budget	Comments
1	44710	Construction Contract (GMP)	\$277,200	
2	44713	Construction Insurance (OCIP)	\$8,300	Worker's Comp, Gen Liab, Excess Liab, Builder's Risk
3		<b>Construction</b>	<b>\$285,500</b>	Total lines 1 and 2
4	44010	Furnishings Under \$5,000 Unit Price	\$19,200	Wall panel, work stations, lab chairs, lab stools, Metro shelf
5	44020	Movable Equipment Under \$5,000 Unit Price	\$0	See budget for Stem Cell Techniques Course
6	44030	Fixed Equipment Under \$5,000 Unit Price	\$87,400	Lab tables, movable lab cabinets
7	44330	Site Preparation/Demolition	\$0	N/A
8	44350	Utility Connections	\$0	N/A
9	44355	Telecommunications/Data Lines	\$5,000	Addl data jacks, wiring at work stations, telephone sets
10	44360	Environmental Remediation	\$0	N/A
11	44365	Security/Audio Visual	\$1,700	Proximity cards for new staff, re-keying
12	44510	Landscape/Hardscape	\$0	N/A
13	44530	Signage/Graphics	\$500	Room & hazmat signage
14	44810	Furnishings Over \$5,000 Unit Price	\$0	N/A
15	44820	Moveable Equipment Over \$5,000 Unit Price	\$1,324,500	Major analytical equipment
16	44830	Fixed Equipment Over \$5,000 Unit Price	\$0	See budget for Stem Cell Techniques Course
17		<b>Other Construction</b>	<b>\$1,438,300</b>	Total lines 4 thru 16
18		<b>Subtotal Hard Costs</b>	<b>\$1,723,800</b>	Total lines 3 and 17
19	42210	Preliminary Expenses (Programming)	\$2,000	Schematic Design fees for preparation of grant
20	44220	Architect/Engineer Fee	\$31,900	Design Development, Construction Documents, Const. Admir
21	44230	Owner's Consultants	\$2,000	Furniture designer, permit processing
22	44240	Reimbursable Expenses	\$5,400	15% of Prelim, Architect & Consultant fees
23	44250	Project Management	\$10,500	2% of construction costs for CCD management
24	44310	Certified Inspection	\$5,000	Deputy inspections
25	44320	Soils Testing/Engineer	\$0	N/A
26	44340	Plancheck & Permit Fees	\$7,100	2.5% of line 3
27	44410	Legal/Administration	\$10,000	Printing, postage/shipping for bid process
28	44420	O&M Shutdown/Activation	\$2,500	Shutdowns, final cleaning
29	44610	Moving Costs	\$0	N/A
30		<b>Soft Costs</b>	<b>\$76,400</b>	Total lines 19 thru 29
31		<b>Subtotal Hard and Soft Costs</b>	<b>\$1,800,200</b>	Total lines 18 and 30
32	44910	Project Contingency	\$47,600	10% of all costs except equipment; 5% escalation & 5% contingency
33		<b>TOTAL PROJECT BUDGET</b>	<b>\$1,847,800</b>	Total lines 31 and 32

University of Southern California Center for Stem Cell and Regenerative Medicine Shared Research Laboratory																							
ID		Task Name	Duration	1	August 1	Septemb	October 1	Novemb	December	January 1	February	March 1											
				7/15	7/29	8/12	8/26	9/9	9/23	10/7	0/2	11/4	1/1	12/2	2/1	2/3	1/13	1/27	2/10	2/24	3/9	3/23	
1		Grant Award	0 days																				
2		Fund Request Preparation by CSCRM	10 days																				
3		Request for Planning Funds	1 day																				
4		Funds Processing by CIRM	11 days																				
5		Funds Released by CIRM	0 days																				
6		Issue Design Contract	10 days																				
7		Prepare Preliminary Plans	10 days																				
8		Approval of Preliminary Plans	5 days																				
9		Prepare Working Drawings	20 days																				
10		Approval of Working Drawings	5 days																				
11		Request for Construction Funds	1 day																				
12		Prepare Bid Documents	5 days																				
13		Advertise for Construction Contract	20 days																				
14		Award Construction Contract	20 days																				
15		Plan Check and Permit	40 days																				
16		Construction Activities	20 days																				
17		Finalize Specifications for Equipment, Furniture & Casework	10 days																				
18		Order Wall Panel and Work Stations	5 days																				
19		Panel & Work Station Lead Time	40 days																				
20		Order Lab Benches and Cabinets	5 days																				
21		Lab Bench and Cabinet Lead Time	60 days																				
22		Order Lab Equipment	5 days																				
23		Lab Equipment Lead Time	40 days																				
24		Completion of Equipment Purchases	0 days																				
25		Fund Request Preparation by CSCRM	5 days																				
26		Request Equipment Purchase Funds	1 day																				
27		Install Panel, Work Stations, Equipment, Benches, Cabinets	5 days																				
28		Equipment Start-Up, Calibration, Testing	5 days																				
29		Final Inspections	5 days																				
30		Beneficial Occupancy	5 days																				
31		Notice of Completion	5 days																				
32		Fund Request Preparation by CSCRM	5 days																				
33		Request Construction Completion Amount																					

ID	Task Name	Duration	Timeline																														
			1/7/15	August 1	1/8/12	8/26	9/9	9/23	October 1	10/7	0/2	11/4	1/1	December	12/2	2/1	January 1	1/2/3	1/13	1/27	February	2/10	2/24	3/9	3/23								
1	Grant Award	0 days																															
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32	Fund Request Preparation by CSCRM	5 days																															
33	Request Construction Completion Amount	1 day																															



## DEMOLITION NOTES

- 1 REMOVE EXISTING LAB BENCHES AND OVERHEAD SHELVES.
- 2 REMOVE EXISTING LAB BENCHES, OVERHEAD SHELVES AND CARRIER.
- 3 REMOVE EXISTING SHELVES.
- 4 REMOVE OFFICE FURNITURE & CARPET. ADD VCT FLOORING.

**Lee  
Burkhart  
Liu**

Lee, Burkhart, Liu, Inc.  
Architecture, Planning, Interiors

13335 Maxella Avenue  
Los Angeles, California 90292  
Phone 310 829 2249  
Fax 310 829 1736

Consultant:

USC CENTER FOR  
STEM CELL AND  
REGENERATIVE  
MEDICINE

Project Name:

Shared  
Research Laboratory

LBL Project No :

26003.120

Date:

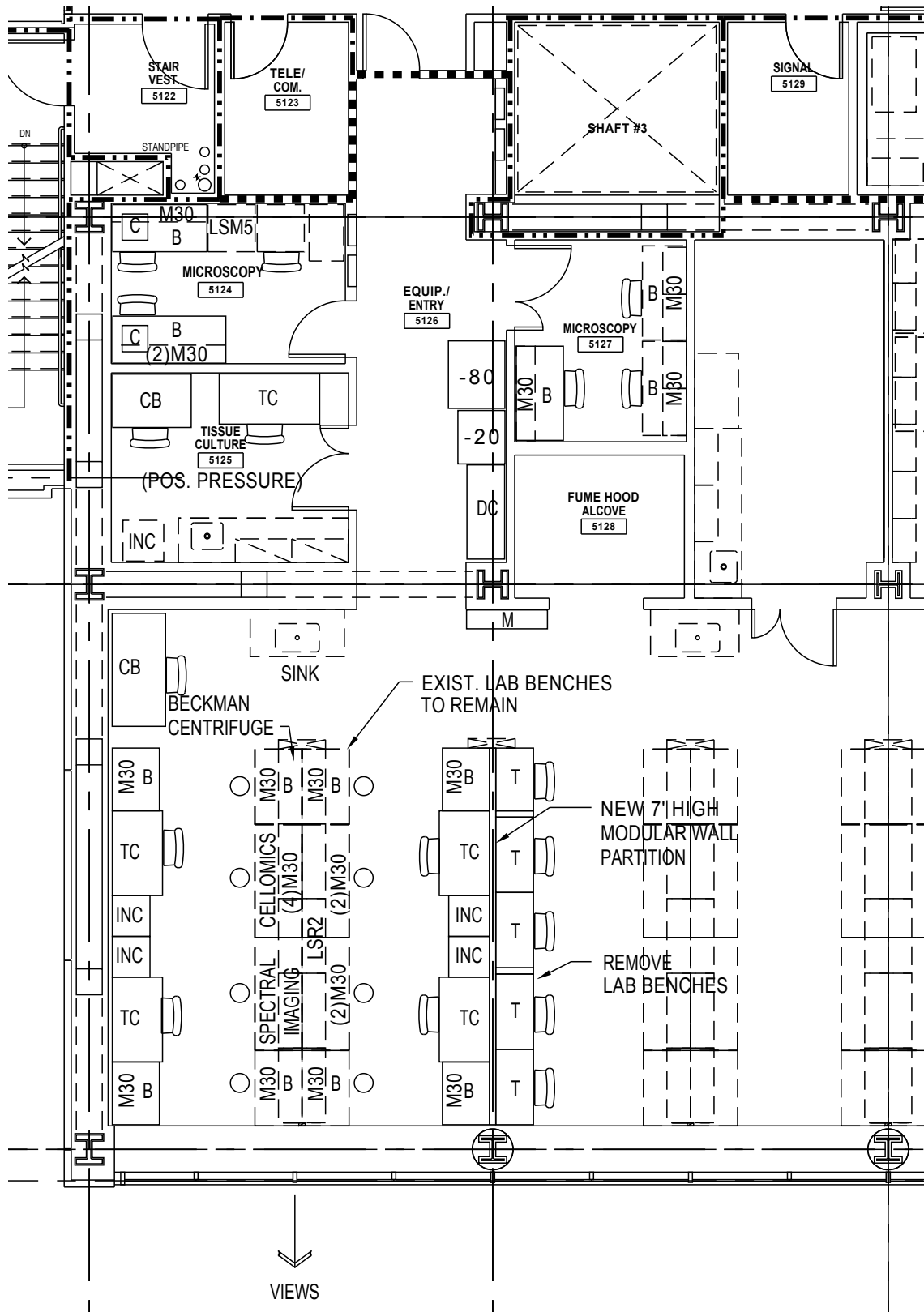
MARCH 16, 2007

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FLOOR PLAN

Scale:

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EQUIPMENT							
DESCRIPTION	QTY	W	D	H	UTILITIES	POWER	REMARKS
TISSUE CULTURE HOOD (TC)	4	54"	32"	90"	Vacuum	115V, 12.4 amp	Non-dusted, no E power, like: NuAire 425-400 class II, type A2
INCUBATORS (I) stacked (10 total)	5	30"	30"	84"	CO2	110V Emer. Ckt	NuAire 5510 DHD Autoflow Air-Jacketed
-80 FREEZER (-80)	1	43"	35"	78"		208/230V 12 amp Emer. Ckt	Harris Maximizer -85C 2.4 cuft
-20 FREEZER (-20)	1	33"	30"	70"		110V Emer. Ckt	Sears
DELI CASE (DC)	1	72"	24"	72"		110V	Sanyo MFR-1013R
CLEAN BENCH (CB) 6ft	1	74"	34"	70"	Vacuum	115V, 18.5 amp	NuAire 6' Clean Bench NU-310-630
CLEAN BENCH (CB) 4ft	1	50"	34"	70"	Vacuum	115V, 14.5 amp	NuAire 4' Clean Bench NU-301-430
LAB STOOL	8						
LAB CHAIR	18						
Phase Contrast/TC microscope	5	18"	18"	18"		110V	Olympus microscope CKX41 (part of TC work station, near hood)
Dissecting Microscope	3					110V	Leica MZ6 wheatech stage (will sit in CB)
Dissecting Microscope- fluorescent	1	36"	36"	36"		110V, and camera	Olympus microscope # SZX-16 with camera (part of TC work station, near hood)
BD LSR II (FACS analyzer)	1	135"	30"	50"		110V X3 dedicated ckt	3-120VAC, 50-60 Hz, 20 amp dedicated circuits, computer and printer
Applied Spectral Imaging (cytogenetics)	1	48"	30"	36"		110 V	computer and printer
Cellomics Vi	1	60"	30"	36"	CO2	110V x 2 dedicated Emer. Ckt	computer and printer
PCR machine	2					110V	BioRad
LSM5 PASCAL:							
Zeiss Axio Imager .M1 microscope	1					110V	Confocal laser scanning microscope
Zeiss LSM5 PASCAL AOTF laser	1					220-240V	Laser
Vibroplane table (N2) floatation	1						N2 to float table: small cylinder attached to table
Zeiss Axio Imager Z1 w/Apochrom microscope	2	60"	30"			110V	bench or table: 30" high
Zeiss Axioobserver, inverted Microscope	2	48"	30"			110V	bench or table: 4-6ft, 30" deep
Beckman Allegra X-15R centrifuge	1	30"	28"	36"		220V	Beckman
low speed, clinical centrifuges	5	18"	18"	18"		110V	Eppendorf, 5207
microfuges	4	12"	12"	12"		110V	Eppendorf
vortex	4					110V	

CONSTRUCTION SCOPE OF WORK

VENDOR	DESCRIPTION
	<b>5108 - OPEN LABORATORY TO BE PARTITIONED TO CREATE THE CSCRM SHARED LAB</b>
R&S	Remove existing lab benches, desks, cabinets and shelves along Gridline #3 and #4. Store in B589.
R&S	Remove four (4) M36 cabinets under the benches along Gridline #3.5. Store in B589.
R&S	Remove existing MT72 bench along north wall. Store in B589.
R&S	Remove ten (10) lab chairs and ten (10) lab stools. Store in B589. NOTE: All chairs and stools will be reinstalled at the end of construction.
POI	Remove plugmold on the east side of Gridline #4 shelf support. Keep plugmold on west side of shelf support.
POI	Install 80" high partitions along Gridline #4.
R&S	Install five (5) work stations on the east side of the new wall each with fixed box/boxfile pedestal, open shelf and task light.
POI	Install four (4) total Tissue Culture hoods. See dwg for arrangement.
R&S	Install eight (8) total incubators (double stack configuration). See dwg for arrangement.
VCM	Add four (4) total MT40 benches. See dwg for arrangement.
R&S	Install one (1) 6'-0" Clean Bench along west wall (Gridline #5).
VCM	Add twelve (12) total M30 moveable cabinet under the benches.
R&S	Provide vacuum to Clean Bench, extended from existing line along Gridline #3. Keep vacuum that exists along Gridline #3.5.
R&S	Provide CO2 to incubators at Gridlines #3 and #4.
R&S	Provide CO2 to Cellomics equipment at Gridline #3.5 plus one (1) extra CO2 outlet at the south end of the benches along Gridline #3.5.
R&S	Provide two (2) total 110V outlets on emergency circuit for incubators along Gridline #3.
R&S	Provide two (2) total 110V outlets on emergency circuit for incubators along Gridline #4.
R&S	Provide one (1) 110V outlet on emergency circuit for Cellomics equipment at bench on Gridline #3.5 plus one (1) extra 110V outlet on emergency circuit at the center of the benches along Gridline #3.5.
R&S	Provide two (2) gas connections to benches along Gridline #3.5, one at each end of the bench.
R&S	Provide one (1) 220V outlet at north end of benches along Gridline #3.5 for Beckman centrifuge.
R&S	Keep all plugmold along Gridline #3 and #3.5.
POI	Return ten (10) lab chairs and eight (8) lab stools. See dwg for locations.
	<b>5124 - OFFICE TO BE CONVERTED INTO A MICROSCOPY ROOM</b>
POI	Remove existing office furniture. Store in B589.
R&S	Remove existing carpet and rubber base.
R&S	Install VCT flooring and rubber base.
VCM	Add one (1) MT60 bench, one MT72 bench, and three M30 moveable cabinets.
R&S	Install overhead shelving above the two benches. Use shelving removed from Gridline #4.
R&S	Provide three (3) duplex data outlets and one (1) telephone outlet. Use two (2) existing available.
R&S	Provide one (1) 220V outlet at north wall for LSM-5.
POI	Add three (3) lab chairs.
	<b>5125 - TISSUE CULTURE ROOM</b>
R&S	Relocate existing Tissue Culture hood closer to the east wall. See dwg for arrangement.
R&S	Install one (1) 4' Clean Bench along west wall.
R&S	Adjust airflow to keep room at positive pressure.
R&S	Provide 110V outlet for Clean Bench. Use existing available.
R&S	Install two (2) total incubators (double stack configuration). See dwg for arrangement.
R&S	Provide two (2) total 110V outlets on emergency circuit for incubators.
R&S	Keep all lab utilities that exist in the room - CO2, compressed air, gas, vacuum.
POI	Add two (2) lab chairs.
	<b>5126 - EQUIPMENT ENTRY</b>
R&S	Remove existing shelves along east wall. Keep shelf supports.
R&S	Install one (1) -80 Freezer.
R&S	Install one (1) -20 Freezer.
R&S	Install one (1) Deli Case.
POI	Install 48" x 24" Metro Shelf unit.
R&S	Provide 210V outlet on emergency circuit for -80 Freezer. Use existing 220V outlet in 5127.

	<b>5127 - MICROSCOPY</b>
VCM	Add one (1) M60 lab bench.
VCM	Add three (3) M30 moveable cabinets.
POI	Add three (3) lab chairs.
R&S	Provide 110V outlet and one (1) data outlet for lab bench on west side of the room. Keep existing outlets on east side of room for the two existing lab benches.
R&S	Install overhead shelving above the new lab bench. Use shelving removed from Gridline #4.
	<b>RETROFIT TO RETURN SPACE TO ORIGINAL CONDITION</b>
R&S	All added utilities (power, gas, vacuum, CO2) to remain. Assume next occupant can use.
R&S	All lab equipment (tissue culture hoods, incubators, clean benches, freezers, deli case, Metro shelf, MT40 benches, and benchtop equipment) to be relocated by user to their new location.
POI	Remove partitions and work stations along Gridline #4.
R&S	Re-install plugmold along east side of Gridline #4.
R&S	Install shelves along Gridline #3 and #4. Assume all new shelves.
R&S	Install shelves along Equipment Entry #5126. Assume all new shelves.
R&S	Install lab benches and cabinets along Gridline #3 and #4. Install cabinets along Gridline #3.5. Assume all new.
VCM	Remove lab benches in Room #5124. Store in B589.
VCM	Remove lab chairs in Room #5124. Store in B589.
POI	Remove VCT flooring in Room #5124.
R&S	Remove overhead shelving in Room #5124.
R&S	Install new carpet and base in Room #5124.
POI	Re-install office furniture in Room #5124.
R&S	Patch VCT and sheet vinyl flooring where equipment anchors created any holes.
R&S	Keep the bench, overhead shelving and chairs in #5127. Assume next occupant can use.
R&S	Keep the Tissue Culture hood, and chairs in #5125. Assume next occupant can use.
R&S	Keep all lab chairs and lab stools in Room #5108. Assume next occupant can use.
POI	Add two (2) lab stools in Room #5108. Assume that the two in storage will be taken by another lab.
R&S	Re-balance air in Room #5125.

Lee  
Burkhart  
Liu

Lee, Burkhart, Liu, Inc.  
Architecture, Planning, Interiors  
13335 Maxella Avenue  
Los Angeles, California 90292  
Phone 310 829 2249  
Fax 310 829 1736

Consultant:

USC CENTER FOR  
STEM CELL AND  
REGENERATIVE  
Client: MEDICINE

Project Name:  
Shared  
Research Laboratory

LBL Project No :  
26003.120

Date:  
MARCH 16, 2007

Sheet  
Title: FLOOR PLAN

Scale:

A2.2



## Keck School of Medicine University of Southern California

March 13, 2007

Office of the Dean

Martin Pera, Ph.D.

Director, Center for Stem Cell and Regenerative Medicine  
Keck School of Medicine, University of Southern California  
1501 San Pablo Street  
Los Angeles, CA 90089-282

RE: CIRM- RFA 07-01: "USC Center for Stem Cell and Regenerative  
Medicine: Shared Research Laboratory and Course in Current Protocols  
in Human Embryonic Stem Research"

Dear Dr. Pera,

On behalf of the Keck School of Medicine of the University of Southern California, I write to express our enthusiastic support for your plans to submit a proposal to the California Institute of Regenerative Medicine for the Shared Research Laboratory and Techniques Course grant opportunity.

As you know, the University is fully committed to the Center for Stem Cell and Regenerative Medicine (CSCRM) here at the Keck School of Medicine and appreciates the larger impact that our Center and its programs will have in the Los Angeles area, the State of California and internationally by providing needed shared resources and training to scientists and clinicians.

The University has demonstrated its commitment to the Center for Stem Cell and Regenerative Medicine by providing nearly \$10 million in start-up funds thus far: over \$2 million of which is from institutional funds; and \$7 million derived from a gift from the W. M. Keck Foundation re-directed for the specific use of your Center to recruit new faculty and to establish necessary core resources. In addition, formal planning is underway to build a new facility in which to house the Center for Stem Cell and Regenerative Medicine. A lead donor has already committed substantial funding towards the construction of this laboratory facility which will be dedicated to stem cell research.

We will continue to provide the funding and resources needed to meet the required matching funds to support this endeavor and the successful implementation of the proposed Shared Research Laboratory and Course in Current Protocols in Human Embryonic Stem Cell Research as described in Part One of the Shared Research Laboratory and Techniques Course grant application.



Thank you for your continued efforts in developing the University's Center for Stem Cell and Regenerative Medicine here at the Keck School of Medicine. You and your team have been instrumental to its successful establishment, and I look forward to continuing working with you to build this important program.

Sincerely,

A handwritten signature in black ink, appearing to read "B. E. Henderson".

Brian E. Henderson, M.D.  
May S. and John Hooval Dean's Chair in Medicine  
Distinguished Professor of Preventive Medicine  
Kenneth T. Norris, Jr. Chair in Cancer Prevention



March 13, 2007

Martin Pera, PhD  
Director, Center for Stem Cell and Regenerative Medicine  
Keck School of Medicine, University of Southern California  
1501 San Pablo Street  
Los Angeles, CA 90089-282

RE: CIRM- RFA 07-01  
"USC Center for Stem Cell and Regenerative Medicine: Shared Laboratory  
Resource and Course in Current Protocols in Human Embryonic Stem Research"

Peter A. Jones,  
Ph.D., D.Sc.  
Director and H. Leslie &  
Elaine S. Hoffman  
Cancer Research Chair

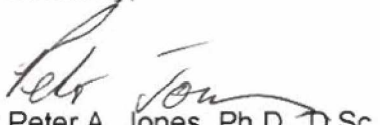
Dear Martin,

We are looking forward to having Center for Stem Cell and Regenerative Medicine scientists working along side our Cancer Center scientists in the new Harlyne J. Norris Research Tower (HNRT). This new ten-story, 172,440 SF additions to the USC Norris Comprehensive Cancer will provide the Keck School of Medicine with new research space devoted to translational and cancer-related research activities. The new research tower includes both wet and dry laboratories, office space, conference rooms and core facilities, a 188-seat conference center, and a roof-top garden.

I have reviewed the floor plans for the shared research laboratory dedicated to work on non-Federally approved human embryonic stem cells and believe that this design is in keeping with our original design of modular laboratories which can be easily subdivided to meet the specialized use while still encouraging interaction among researchers, clinicians, students and staff. Furthermore, we see this type of shared laboratory dedicated to the training of new investigators in the field of hESC research vital to adding depth and breadth to the field and vital to promoting collaborations within USC and across research institutions in the Los Angeles area.

I am excited about your proposal and look forward to working with you and your colleagues to develop a deeper understanding of human embryonic stem cells that will lead to new therapies.

Sincerely,

  
Peter A. Jones, Ph.D., D.Sc.  
Director

USC/Norris  
Comprehensive  
Cancer Center

Keck School  
of Medicine  
University of  
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A Comprehensive Cancer  
Center Designated by the  
National Cancer Institute

## Appendix A

Application: CL1-00524-1

### **Title: USC Center for Stem Cell and Regenerative Medicine: Shared Research Laboratory and Course in Current Protocols in Human Embryonic Stem Cell Research**

#### **Public Abstract:**

To realize the potential of human embryonic stem cells (hESC) in research and medicine, it is essential to disseminate state of the art technology in this field to the scientific community at large. The Shared Research Laboratory (SRL) of the Center for Stem Cell and Regenerative Medicine (CSCRM) at the University of Southern California will aim to provide a comprehensive support service for hESC researchers at our University and at neighboring institutions. The mission of the SRL will include the following goals: 1) to supply scientists with quality controlled stem cell lines for use in their research, including cell lines that are not eligible for use in NIH-funded projects; 2) to provide space and equipment for scientists new to the field to carry out pilot projects, in order to help them to integrate the hESC platform technology into their own research programs; 3) to develop and validate new and improved methods for growing hESC in the laboratory; 4) to operate a formal practical course in hESC laboratory techniques to scientists from throughout the region.

The facility will be situated in the new Harlyne Norris Cancer Center tower on the USC medical school campus. The laboratory will have sufficient work stations to support training, collaborative projects, and research and development programs for evaluation of new stem cell culture techniques, and it will be equipped with specialized instruments required to monitor stem cells. The operation of the facility will be overseen by the Program Director and the Manager of the CSCRM Core Facility. Advice on access and management will be provided by a subgroup of the CSCRM Stem Cell Advisory Group comprising stem cell researchers from USC, Children's Hospital of Los Angeles, and California Institute of Technology.

The SRL will support the work of CSCRM scientists and their colleagues at neighboring institutions involved in basic research on hESC, including international collaborations on standards for this research. The facility will also enable many groups involved in translational work at the USC medical school to gain experience and training in the use of hESC in their work in areas such as neurology, liver disease, cardiology, and ophthalmology. These scientists will be able to conduct preliminary studies in the facility under the guidance of experienced staff.

The SRL will offer a 5-day course on Current Protocols in Human Embryonic Stem Cell Research, to provide a comprehensive practical training for investigators wishing to use hESC lines in their research programs. Laboratory instruction will include demonstration of the most commonly used methods for cultivating hESC, methodology for assessing the purity and quality of hESC cultures, and methods for converting hESC into specific cell types such as nerve or blood cells. The training course will be available to scientists from institutions throughout the Los Angeles area and will be held 3-4 times per year.

#### **Statement of Benefit to California:**

The California Institute of Regenerative Medicine has as its goal the development of stem cell and related research for the treatment of disease. Human embryonic stem cells (hESC) could provide an indefinitely renewable source of any type of healthy human cell for use in research and therapy, and are therefore the focus of widespread scientific excitement. However, because the development of hESC technology is still at an early phase, significant technical barriers exist for new workers entering the field. The proposed Shared Research Laboratory (SRL) in the Center for Stem Cell and Regenerative Medicine (CSCRM) at the University of Southern California will act as a hub for dissemination of state-of-the-art technology in hESC research throughout the region. By training students and established investigators in the practical skills required for hESC use, and by providing shared space for pilot and collaborative projects, the SRL will vastly accelerate stem cell research in Southern California. The SRL will also carry out research and development aimed at evaluating new technologies for hESC research, and will incorporate new discoveries by participating scientists into validated protocols for maintenance and differentiation of hESC. This role, which will include participation in international collaborative efforts for assessment of hESC methodology, will ensure that the SRL scientists benefit from the most recent advances in hESC research, and that their own discoveries are integrated into best practice for hESC research globally. California, and the greater Los Angeles area, will thus become an international focal point for hESC research. As workers involved in translational and clinical research learn to apply hESC in their studies, basic discoveries in stem cell biology by SRL trained researchers will move towards clinical application. The availability of the SRL will also provide a needed boost to the development of biotechnology in the Los Angeles area.